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HUMAN RADIATION EXPERIMENTS

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- Reported to JRE 5/17/65

Results from preliminary work with Methyl iodide:

1. Methyl iodide is very difficult to handle because of its high volatility
2. It appears that its deposition velocity is at least two orders of magnitude lower than that of molecular iodine
3. There are no major behavior differences once it has been ingested by the cow.
4. Collection efficiency for a high volume carbon cartridge is about 25%.

5/14/65 Mike Tiernan

Preliminary Expermentation in the Environmental Chamber

Methyl iodide was generated over grass in the environmental chamber to make a preliminary determination of the affinity of methyl iodide for adhering to grass. The deposition was expected to be quite small because of the relatively low reactivity of the molecule.

Approximately 120 uCi of methyl iodide in 20 ml of alcohol was released over the grass over a pericd of two minutes. Each of the four high volume air samplers which pull air from the chamber ~~were~~ WAS pulling about 25 - 30 cfm. Immediately after the iodide was released, a grass sample was taken from the box and gross gamma counted. Two more samples were collected after the first at ten minute intervals. This was done to determine how much methyl iodide, if any, ~~would leave~~ LEFT the grass once it had deposited.

The first sample counted about 200 c/m, or about 3c/m/g. The two subsequent samples counted 190 and 240 respectively, or about 2 and 4 c/m/g. Only two subsequent samples were collected because the grass that could be reached through the glove box ports was limited; more samples could not be collected without opening the chamber.

In order to determine if the small deposition of methyl iodide on the grass was a consequence of the nature of its volatility, or if it was a consequence of the characteristics of the chamber, a second test, using sodium iodine, was conducted shortly

after the first. The flow of air through the chamber was the same as in the first test.

The second test was conducted with 15 uCi of iodine generated over a 20 minute period. Five grass samples were collected at intervals of a few minutes. The high sample counted 178 c/m/g and the low sample counted 76 c/m/g. The average of the five samples was 140 c/m/g.

A comparison of the results of the first and second test would seem to indicate that, ~~the low deposition of methyl iodide is indeed a consequence of its nature~~ as a consequence of its nature, no methyl iodide deposited on the grass. The methyl iodide grass, contaminated with 120 uCi over a 2 minute period, had only an average activity of about 3 c/m/g; WHICH IS ESSENTIALLY BACKGROUND the sodium iodine grass, contaminated with 15 uCi over a 20 minute period, had an average activity of 140 c/m/g. ~~These results cannot be considered very conclusive however because of the differences in amount of activity and length of time between the first and second test. These factors may well be masking differences or similarities of the two iodine forms.~~ It appears that, since none of the samples collected from the methyl iodide test were significantly above background, ~~methly~~ none of the methyl iodide deposited on the grass.